**MULTIMEDIA IN LEARNING AND TEACHING**

**[INSERT BANNER]**

With the constant advancements being made in technology which has a direct impact on society, it is without doubt that these technological advancements will have an impact on the nature of learning and teaching. This mini-course on multimedia will place emphasis on:

* Its definition, the types of multimedia found and how these can be utilised within the educational context.
* The strategic placement of multimedia within the educational fraternity as it provides the most relevant and updated tools needed to engage the learner of the 21st century.
* How the utilisation of multimedia can prove beneficial to teaching and learning.

[**INSERT VOKI CHARACTER WITH DIALOGUE**]

The objectives of this mini-course are:

* Understanding what multimedia is.
* Identification of different types of multimedia.
* The usage and integration of the different types of multimedia.
* Knowing what to “DO” and “NOT TO DO” when using multimedia.

**How is this course structured and duration guide?**

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|  |  |  |
| **Module 1** | Definition of multimedia Week One - 2hrs  Popular print media  Instructional techniques for appropriate multimedia use |  |
| **Module 2** | Print media Week Two - 3hrs |  |
| **Module 3** | Electronic media  Week Three - 3hrs |  |
| **Module 4** | Using computer technologies Week Four - 3hrs |  |
| **Module 5** | Do’s and Don’ts of multimedia use  Week Five - 2hrs |  |

**How the Self-Assessment Works**

**The self-assessment will help you to master specific competencies. The assessments will comprise of multiple choice questions, short questions and application type questions. Your engagement with these assessments throughout the course will result in achieving badges to qualify for other advanced courses. Your final assessment will test all content and applications engaged with during this mini course.**

**MODULE ONE: UNDERSTANDING MULTIMEDIA**

***DEFINITION:*** Multimedia combines five basic types of media into the learning environment:

text, video, sound, graphics and animation, thus providing a powerful new tool

for education.

[INSERT VIDEO CLIP ON DEF: MULTIMEDIA]

It is important to note that there a large variety of multimedia available but due to the nature of this mini-course we will be discussing only some of them with special emphasis on computer technologies.

Prior to starting with the types of multimedia, it is important to understand the following concepts.

**Educational Technology**

Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources. It is most simply and contentedly defined as an assortment of tools that might prove helpful in student centered learning, problem based learning or case-based learning. It advocates the teacher becoming “Guide on the Side” rather than “Sage on the Stage”. Educational Technology also called “Learning Technology”, mainly comprise of the use of technology in the process of teaching and learning. Here the term “Technology” does not only include the use of latest tools and techniques like laptops, interactive whiteboards, and smart phones; internet, Wi-Fi, and YouTube etc., although they are massively preferred by today’s learners for their learning potential, but also encompasses efficient and enhanced learning management systems, schema of information dissemination, effective teaching and management of student masses, feedback mechanisms and performance evaluation methodologies etc.

**Multimedia Learning Environment**

Multimedia provides a technology based learning environment where students are able to solve a problem by means of self-explorations, collaboration and active participation. Simulations, models and media rich study materials like still and animated graphics, video and audio integrated in a structured manner facilitate the learning of new knowledge much more effectively. The interactive nature of multimedia provides the room to enhance traditional "chalk-and-talk" method of teaching with more flexibility to learners to adapt to individual learning strategy. It enables both the educators and learners to work together in an informal setting. The role of educators and learners are extended. Furthermore, it encourages and enhances peer learning as well as individual creativity and innovation.

**Popular Print Media**

**[ Insert video clip 1 of SAIDE]**

The term '*popular* media' describes a wide range of media, including magazines, newspapers, television and radio, whose main purpose is to inform, entertain or persuade. But popular media also carry resources designed specifically for *educational* purposes. Many teachers use popular media programming with clear educational *content* and *intent* – such as the SABC's *Learning Channel* or *Learning Zone*, or the teaching supplements carried in newspapers like *The Teacher* – in their teaching.

However, teachers don't tend to exploit the educational potential of *non- educational* popular media programming, such as soap operas (*Isidingo* or *Generations*), orsoccer commentaries, or newspaper cartoons. In this section we will explore howpopular *print* media – in particular newspapers and magazines – can be used toimprove classroom learning and teaching.

Let's tackle some definitions now.

• We define media as those resources that are deliberately used to communicate with us. The purpose of the communication may be to entertain, inform, educate or persuade.

• Popular media refer to media that are used by large numbers of people, and include television, radio, films, newspapers, magazines, advertising leaflets, billboards, and the internet. Their major purposes are to entertain, inform, and persuade.

• Educational media refer to media developed specifically for the purposes of educating. The most common example would be textbooks. 'Structured learning packages' – print based, on the Internet, or in the form of CD-Itbms – are becoming more widely used. All educational media are characterized by a selection of content which is then logically ordered so as to develop learning.

*Popular media* can (and should) play an important role in *supporting* learning. Their strength lies in creating a connection between the learners' experiences and school learning. They can activate learner interest, and can also be used at the end of a learning process when learners explore ways in which formal school knowledge can be usefully applied in real life. But popular media are not designed in the logical, structured and developmental manner that is essential to good, higher-level learning. This is why *educational media*, especially well-designed textbooks, should remain the *foundation* on which learning in schools is built. While Nomsa frequently used popular media, she used textbooks and other kinds of educational media to *consolidate* learning. Textbooks are designed in a manner that provides teachers *and learners* with a structured, well sequenced path towards a high-level understanding of key concepts in their learning area. In this sense, they are very valuable learning aids.

**INSTRUCTIONAL TECHNIQUES FOR APPROPRIATE MULTIMEDIA USE**

*Prepare a Class Plan.*

The class plan is perhaps the most important resource for the successful use of multimedia materials, because it guides the selection of media and provides the context for each media element. Conceived of in this way, multimedia programs and materials are tools to direct attention and emphasize key points that are best understood visually rather than all-purpose guides for every point of every lecture. Instructors who begin integrating multimedia into their classes often report that the media use forced them to improve the organization of their class sessions—which may be an added benefit to students.

*Develop the Class Plan as a Slideware Presentation.*

Many instructors use PowerPoint, Keynote, Flash, or a series of linked web pages to organize and present their lecture outline and media. Because PowerPoint is available on nearly 100% of classroom computers, it has become the organizing tool for most instructors. Thus we will focus our comments on PowerPoint, even though we recognize that other tools have some specific advantages.

*Build In Some Flexibility.*

One major objection to integrating slideware fully into classroom courses is that it would rob instructors of their flexibility – to diverge from the topic, or go into more depth on one topic, or make an adjustment in response to student questions. The perception of loss of flexibility is related to the amount of planning that it takes to develop a slideware presentation. Once developed, instructors feel that they have to stick to the order and get through all of the content. But there are ways to get around this situation. Remember that less is better when it comes to slideware. By creating guiding bullets as opposed to paragraphs of text, maximizing clarity, strategically including visuals for specific impact rather than just because they may be cute, and minimizing distraction, the slideware becomes more of a guide than a script, allowing instructors to take charge of the flow and use the program to direct it. There are times, however, when you may want certain resources available just in case students have a particular question or you want the option to talk about a topic at greater depth. Again, slideware does not have to be linear and can be made to accommodate many contingencies. Such flexibility can be accomplished, for example, by creating custom shows (groups of slides arranged by topic) or menus of links to specific slides that you may or may not choose to access.

*Fight Against the “Mind-Numbing” Properties of Slideware.*

Strong criticisms have been leveled against slideware in general and PowerPoint in particular.

Here is a summary of criticisms against PowerPoint presentations:

• PowerPoint encourages simplistic thinking, with complex ideas being squashed into bulleted lists, and stories with beginning, middle, and end being turned into a collection of disparate, loosely disguised points. This may present a kind of image of objectivity and neutrality that people associate with science, technology, and "bullet points".

• PowerPoint presentations seem designed to guide and reassure a presenter, rather than to enlighten the audience;

• PowerPoint encourages the use of unhelpfully simplistic tables and charts, tied to the low resolution of computer displays and the need for text to be readable by a large audience.

• PowerPoint lends itself to poor typography and chart layout, especially by presenters who use poorly-designed templates and PowerPoint’s default settings;

• PowerPoint’s outline format leads presenters to arrange material in an unnecessarily deep hierarchy, itself subverted by the need to restart the hierarchy on each slide;

• PowerPoint’s “click-for-next-slide” mentality enforces a linear progression through the presenter’s hierarchy of ideas (whereas with handouts, readers could browse and explore items at their leisure); Other experts argue that we should blame the presenter, not the tool, for mind numbing presentations. Some also argue that cognitive research demonstrates the value of hierarchical organization for comprehension and memory, and point out that the audience generally attends a presentation in order to hear the presenter’s organization of ideas rather than to explore the topic on their own. Many of the criticisms of such presentations are a result of using the program, rather than the lecture outline, to guide the development of the presentation.

*Where Possible, Include Animations and Video Clips.*

Although it requires moreeffort to locate and insert these types of materials (not to mention the effort involved increating your own animations and video), research suggests that these materials have aparticularly powerful impact on student learning. As you goover the material you want to present in class, look for places where an animation orvideo clip would be particularly helpful in illustrating a dynamic process that changesover time or has multiple stages. Then look for suitable ready-made animations or videosegments that you could plug into the presentation. If you can’t locate an acceptableanimation, create it yourself, using the simple animation tools built into PowerPoint orKeynote. Even better, enlist the aid of a student or campus technology consultant to helpcreate it in Flash or some other powerful animation software.

*Use Multimedia in Creative Ways.*

Although multimedia materials may have some value when merely added to a PowerPoint lecture outline, many instructors are exploring ways to incorporate these materials in collaborative learning activities involving case-based scenarios or problem-based exercises.

*Get the Right Equipment.*

The equipment is relatively straightforward, and already widely available in many classrooms, a standard computer system equipped with a CD/DVD drive, external speakers, and an internet connection, with the computer output displayed through a digital projector. A TV/VCR may also be required for instructors who have not yet made the transition to an all-digital format, or for the presentation of commercial videotapes that cannot be digitized legally.

*Obtain Good Multimedia Content -- Legally.*

However, the equipment won’t be of much use unless you have a good set of multimedia materials and a carefully developed plan for organizing the entire class session to incorporate the media effectively. In the past, obtaining good media materials was quite a challenge; early adopters of technology often spent many hours scanning images from textbooks and creating their own audio and video clips. Fortunately, many textbook publishers now provide libraries of images, animations, and video segments licensed for use in class—although instructors may still want to augment these collections with other materials. The same computer technology that facilitates multimedia creation and distribution makes it temptingly easy to obtain materials from a wide variety of sources. Photos may be scanned from magazines, and images and animations may be captured from web pages; for example, search sites such as Google allow a user to scan the Internet for a vast selection of images using a powerful keyword search engine. Audio and video clips may be digitized from videotape or captured from CD or DVD sources, or downloaded from the Internet.

**MODULE TWO: PRINT MEDIA**

1. Non-digital Print Media

Different popular print media formats

*'Popular print media'* is a term that describes a wide variety of media formats that include newspapers, magazines, billboards, and advertising flyers. Our focus will be magazines and newspapers, but even these are different enough to offer teachers a rich variety of potential teaching resources. First, while both magazines and newspapers tell their (stories' using similar formats – words, photographs, diagrams, graphics, cartoons, statistics, advertisements, letters from readers, horoscopes and puzzles – they differ in important ways:

• In general, magazines are concerned with *entertaining* their readers, while

Newspapers focus more on *informing* readers.

• Magazines contain many in-depth 'human interest' feature stories: stories about places

or personalities. Newspapers, however, carry mainly short, 'hard news' stories with a

few in-depth stories linked to the news and politics.

• Magazines make more use of photographs – colour fully and prominently – and carry

more colourful adverts. Newspapers carry photographs of recent events, diagrams,

graphs, maps and tables of statistics, weather, financial and entertainment information,

and political cartoons and editorials linked to the latest news.

Second, not all newspapers and magazines are the same: they differ according to the kind of readership they try to attract. While many could be classified as 'general interest' publications – *Cosmopolitan, Bona, The Sowetan, The Star*, there are others that can be regarded as 'specialist' publications – *Business Day, New Sdentist, or* *Getaway*, for instance.

Specialist publications offer more in-depth articles that could be useful in teaching subject content. We also noticed that weekly newspapers – such as the *Mail and Guardian* or *Sunday Independent* – carry longer, more analytical articles than daily newspapers. Publications in South Africa still tend to target racially-defined audiences. So, for instance, while *The Sowetan* may carry news that some would regard as being of interest to an 'African' readership (for instance, lots of soccer news), *The Star* seems to target a predominantly white audience (it carries lots of rugby news).

Social class – or income – is also emerging as important in the kinds of articles carried by magazines or newspapers. A magazine like *Ebony*, for instance, seems to cater for a (younger) black, upper middle-class audience, while *Bona* seems to cater for a slightly older, less affluent black audience. It is important to understand some of these differences, not only so that we can use popular print media appropriately, but also so that we become more familiar with the way in which the media work.

Third, as we have mentioned, each magazine or newspaper carries a wide variety of formats within their covers: from adverts and cartoons through to statistics, photographs and good writing. This variety – of formats used within publications, of differences between magazines and newspapers, and differences among magazines and newspapers – provides teachers with a rich pool of teaching and learning resources.

**[Insert activity of how to use print media]**

**MODULE THREE: ELECTRONIC MEDIA**

**2. Electronic media**

**[Insert video on digital media]**

Popular *electronic* media provide teachers with excellent resources for improving language skills, such as listening and speaking. Like newspapers and magazines, radio and television also provide a rich resource base for enriching the teaching of content knowledge in different learning areas. Television and radio carry a variety of formats. Many are common to both – such as advertising and news - but the different nature of each medium tends to favour particular formats:

• Radio, for instance, is dominated by *audio-based* formats, such as music, talk shows and

news.

• Television, however, is dominated by formats that are *visually strong,* such as drama, news

and documentaries.



The range of formats used in popular electronic media

• *News and current affairs* often appear on both radio and television. These provide an excellent means for teaching history-in-the-making, politics, civics, life-skills, business and economics, and current affairs.

• *Special interest magazine programmes and documentaries* are also common on *some* radio and television stations. In South Africa, *Safm* and SABC3 tend to broadcast the most informative and interesting programmes on science and technology, arts and culture, and development and ecological issues. There are also shows that focus on language issues and books.

• *Talk shows and interviews.* While both television and radio flight a large number of talk shows, on the whole radio (in particular *Safm*) broadcasts the most *in-depth* interviews. These help learners to gain up-to-date information, sometimes from experts, on issues such as health, science, environment and the economy. Listening to interviews also familiarizes learners with questioning techniques.

• *Soap operas, dramas and movies.* While almost all radio stations used to carry soap operas, only a few stations still do. But a large amount of television broadcast time is dedicated to these formats. Some raise interesting ethical and political issues, and teachers could use *short* excerpts from these to raise debates in learning areas such as *life orientation*.

• *Advertisements.* Radio adverts are often extremely inventive since they have to rely totally on words, sounds and music. Many television adverts make use of extremely sophisticated techniques to get viewers to associate products with certain ideas and 'images'. Both qualities make adverts ideal resources for teaching critical thinking and media literacy.

• *Songs and music.* These can be used to develop an understanding of idiom and other modes of language use, They also engage the learner in a way that poems or textbook passages might not, and are often useful in values education.

• *Weather reports.* Climatology is a traditional part of the curriculum, but is often taught in a highly abstract manner. Weather forecasts, particularly those on television that use symbols, can be used to contextualize this content.

• *Sports commentaries and traffic updates* are carried by both radio and television.

Although they don't have direct relevance to school curricula, imaginative teachers have used them to activate learner interest in school subjects in interesting ways. In addition to these popular formats, many radio and television stations carry more consciously *educational* programming. This includes:

• *Programming linked directly to formal schooling.* The South African Broadcasting Corporation (SABC), for instance, broadcasts *Learning Channel* (directed at senior and further education learners) and *Schools TV* (which provides support for Foundation Phase teachers). Both of these are directly related to the formal school curriculum. Some newspapers, for instance *The Sowetan*, even carry the print versions of the lessons broadcast.

• *Programming that is broadly educative and informative.* This includes: - SABC education department magazine programmes such as *Take 5*. These *support* schooling but do so in an entertaining and informal manner (and are thus sometimes called 'edutainment').

- Edu-dramas, such as *Yizo- Yizo* and *Soul City.* These tend to tackle issues of broad public concern, for instance, drug-taking, health, domestic violence, or the culture of schooling, but 'teach' through popular television formats like soap operas.

-Various kinds of documentaries and magazine programmes, such as the environmental

programme SO /50, or the information technology programme, *InTouch*. These are not designed for any direct educational use but provide enormously valuable resources that teachers can use in classrooms.

Using radio as a learning resource

Radio is essentially an *auditory* medium: it tells stories through words and sounds. It is not surprising, then, that radio is particularly good for developing language skills such as listening in particular, and *speaking*. But it also provides resources for supplementing the teaching of content knowledge. Radio programming can be used to teach a wide range of knowledge and skills.

**Radio:**

• *models appropriate use of language.* It demonstrates to learners how language is spoken in different ways in different situations. For instance, while the news reader uses formal language, the person hosting a talk show or phone-in programme will be more relaxed and informal.

• *provides a means for learners to practise listening and note-taking skills.* It offers interesting content and, when recorded, can be controlled by teachers and learners in order to maximize the learning that takes place.

• *opens up a wide range of options for multi-lingual teaching* because it broadcasts in most of South Africa's official languages.

• *carries hours of music and popular song* which can be used productively in the hands of a creative language teacher. In fact, as we show, pop songs offer teaching opportunities for teachers of other learning areas too.

• *has been called the 'theatre of the mind'* because it allows listeners so much freedom in using their own imagination. Radio gives you only sounds and voices from which you are free to imagine different kinds of people and places.

In addition to encouraging the use of *imagination*, radio programmes – news programmes, interviews, documentaries and magazine programmes – contain large amounts of new *information* that can add to learners' knowledge on a particular topic, for instance science, local environments and economics. This provides teachers with a rich resource for updating and supplementing teaching across the curriculum.

**Making the best use of radio**

To use radio effectively, teachers must consciously teach learners to *listen.* Radio requires *sustained* and *active listening* abilities, in the same way as reading a book requires mental activity. In addition, teachers must keep an eye on radio listings in order to record useful resources for learning. On the one hand, this is relatively easy. In South Africa most radio stations are news and music stations so the number of stations to monitor is limited. In order to access resources to supplement content knowledge teaching, *Safm* is probably the best source. However, regional language stations carry school linked educational programming and soap operas, while some community and regional stations run talk shows that sometimes have interesting guests and/or debates on controversial issues.

On the other hand, keeping an eye on radio listings is difficult. First, the programming of all stations is seldom listed in one publication. Second, as you will notice in the listing below, details of each programme are never listed. In other words, teachers need to listen with their finger on the record button!

Using television as a learning resource

Television is essentially a *visual* medium: it tells its stories in images. As a medium, it 'likes' action and movement rather than words and sounds. It presents complete pictures of people and places. It doesn't ask you to imagine. In this sense, it is a passive medium – it does most of the imaginative work for you. This provides educators with both a warning and an opportunity:

• First, we must find ways to ensure that learners view television, videos and films *actively*.

• Second, we must use the power provided by the 'completeness' of the medium - the combination of explanation and visual illustration.

Television provides teachers with the means to:

• transport learners to foreign lands in travelogues, the news and films – teachers don't need to record entire documentaries;

• bring historical events alive through documentaries or historical films;

• illustrate abstract and complex biological, geographical and scientific concepts in magazine programmes or documentaries.

The combination of moving visual images and sound make television – *when used well* – a powerful educational medium: it is able to turn abstract concepts and ideasinto concrete, visual ideas. Consider the micro-photography that is able to show theinside workings of the human body, or the shots of our solar system taken fromspacecraft. Images such as these help learners to break down some of their barriersto understanding.

**Making the best use of television**

First, teachers don't always need to wait for and record full-length documentaries that fit their teaching entirely. Often a short clip of a volcanic eruption or a hurricane recorded from the news will enrich learning. Likewise, a two-minute recording of a television weather report will allow learners to visualize cold fronts and give meaning to synoptic symbols far more quickly than hours of explanation.

Second, because television is ephemeral and distracting – the images and words are there, then they are gone, and there are many messages on the screen at any one time – teachers need to find ways of 'slowing down' the action and consolidating the message. This can be done by:

• supporting television-based lessons with print-based materials, such as worksheets, textbooks and popular print media;

• using television with one of the message channels - sound or image – switched off. (In this section, we provide ideas on how to do this.)

Third, television is a passive but powerful medium: it sucks viewers in without requiring much critical engagement. Teachers need to develop critical media literacy in their learners if they are using television as a teaching aid. As with radio, teachers face the challenge of collecting resources from television regularly: this cannot be done the night before you teach! Luckily, television listings are far more detailed than radio listings. In general, though, magazine programmes seldom advertise their content in the listings.

So teachers still need to choose potentially useful programming and watch these with a finger on the record button!

**MODULE FOUR: COMPUTER TECHNOLOGIES**

**Multimedia Applications for the Classroom**

There is a clear disconnect between the media students are accustomed to using outside the classroom and the media they predominantly use within the classroom. Students spend copious amounts of their free time socializing, shopping, and even studying on the Internet, where they are flooded with text, images, video, animation, and sound in what is a complex multimedia environment. The younger generation is intimately familiar with multimedia, accustomed to receiving and sharing information in a range of formats. In contrast, students spend most of their time in the classroom viewing printed text and listening to a teacher. This disconnect is troublesome. While students are accustomed to having a range of means to communicate and process information outside of school, they must conform to a more restrictive media environment within school. Printed text is one-size-fits-all, but students' learning strengths, needs, and interests are all over the map. Thus, the traditional print-driven curriculum raises a number of barriers to access and learning.

Integration of multimedia into instruction can help to reduce curriculum barriers and improve learning for all students. This article provides a basic introduction to multimedia and describes how it can be used to support student learning.

**A general definition of multimedia**

Multimedia is in essence a presentation of information that incorporates multiple media such as text, audio, graphics, and animation. The representations can be redundant, incorporating the same content, or complementary, offering additional information. Multimedia need not be computerized, but computers offer some of the most seamless multimedia presentations. Moreover, digital multimedia, such as a simple CD-ROM, can offer teachers greater ease of presentation.

**Types of multimedia and their classroom applications**

There are numerous types of multimedia. Below we review a selection of different multimedia forms, focusing on their potential for supporting diverse learners.

**Talking books and speech synthesis**

Digital texts can be read aloud using recorded human voice or synthetic text-to-speech programs. Read-aloud is an intrinsic feature of so-called talking books, but with text-to-speech software, virtually any digital content—including web-based texts—can be read aloud, with or without synchronous highlighting of the printed text. Speech synthesis can be segmented at a variety of levels, providing feedback at the level of the passage, sentence, word, onset rime, syllable, or subsyllable. Read-aloud offers potential benefits to many students, including students with visual deficits, students with decoding problems, and reluctant readers. In addition to providing access to curriculum content for those who cannot see or decode printed text, read-aloud can support the development of key literacy skills such as fluency and reading comprehension, and increase engagement and motivation.

Text-to-speech is also a beneficial writing tool. It may be easier for students to recognize errors when listening versus reading a composition. By using text-to-speech to read back the text they have written, students may be able to revise more successfully.

**CD-ROM storybooks**

CD-ROM storybooks offer digital text in combination with features such as animations, illustrations, speech, and sound. For example, a CD-ROM storybook might offer the story text together with animations, vocabulary definitions, and sound effects. Some storybooks incorporate an audio version of the text. CD-ROM storybooks offer great potential for engaging students, and some incorporate valuable literacy supports. Thus, they can benefit reluctant readers and students with deficits in basic literacy skills. However, their multimedia features are not always instructionally germane. Some storybooks feature entertaining animations and sound effects that, while entertaining, do not directly support access or learning. In fact, they may be distracting for some students. Thus, teachers are wise to select CD-ROM storybooks carefully and with consideration of individual student characteristics.

CD-Roms (Compact Disk-Read Only Memory) are similar to commercial audio CD-disks (music CDs) but can store audio (sound), video, text (typed words) and graphics (pictures). This mix of media in a single technology is referred to as 'multimedia', Multimedia resources can either be distributed or accessed using CD- Roms or the World Wide Web (WWW). The text that appears on your computer screen when you open a site on the WWW, or open a CD-Rom programme, will look much like what you are used to finding in books. But it has at least one important difference: the existence of what are called 'hyperlinks'. You may notice that some words in the text appear in a different colour, or are underlined. This generally indicates that they are *hyper-links* – which indicate that you can move directly from this word to linked ideas elsewhere on the CD-Rom, or anywhere on the WWW. Hyperlinks have made navigation through multimedia materials much easier since, with the click of a mouse button, a user can bring up different screens, playavideo or audio clip, or switch to a standard computer application.

As CD-Roms store and play back huge amounts of data, they are commonly used for storing any type of computer files (for example, for archiving files), as an alternative way of publishing books, for storing and distributing computer software, games and educational materials. The data can either be plain text (such as a dictionary or thesaurus, or word document) or include pictures, photographs, audio or video clips (such as a multimedia encyclopaedia).

**Video/videodiscs**

Video/videodiscs offer a means to contextualize curriculum content and instruction across the curriculum. For example, video can be used to anchor mathematics instruction to an authentic context. That is, video can be used to present to students a real-world context within which mathematical problem-solving can then be situated. Video/videodisc-based anchored instruction can similarly be applied to contextualize instruction in other content areas. These approaches are valuable in helping to engage and motivate students, in providing students with alternatives to text, and in supporting differences in background knowledge.

**Hypermedia**

Hypermedia refers to hyperlinked multimedia—the linkage of text, audio, graphics, animation, and/or video through hyperlinks. For example, a hypermedia study guide might offer illustrated textbook content hyperlinked to web-based video and other content, glossary entries, and comprehension questions. Other hypermedia applications for the classroom include supported digital reading environments and lessons.

Hypermedia offers a powerful means to integrate curriculum content with instructional supports and address varied student needs. Digital texts can be enriched with a range of instructional supports such as vocabulary definitions, glossaries, translations, explanatory notes, background information, and instructional prompts. Each of these supports can take the form of varied media. For example, vocabulary definitions might be presented as text, pictures, and/or animated graphics. Background information might be presented as a map, video, annotated bibliography with text and audio, or illustrated timeline.

Hypermedia can support differences in students' ability to access specific media forms and differences in their literacy and media literacy skills; they also provide alternative means to engage learners. Using hypermedia, teachers can help a variety of learners, including English language learners, second language learners, and students with comprehension problems, to overcome important barriers posed by printed texts. Moreover, because the various supports are present as hyperlinks, students can access them individually, as needed, and on-demand.

In addition to offering new means to present curriculum content, hypermedia offers new means for students to demonstrate knowledge and skill. Using hypermedia design software, students can construct multimedia compositions that afford them a much greater range of possibilities than text. This is particularly important for students whose difficulty with writing might obscure their mastery of curriculum content.

**Computer simulations**

Computer simulations are computer-generated versions of real-world objects (for example, a brain) or processes (for example, an election). They may be fully automated or interactive, eliciting user input. Computer simulations are a means to "open up the walls of the classroom," providing students with an opportunity to observe, manipulate, and investigate phenomena that are normally inaccessible—an orbiting satellite or foreign culture—using tools and materials that are not available in the classroom. In this respect, they provide an advantageous alternative to learning that might otherwise rely on lecture and printed text. Not only do simulations reduce barriers for students who struggle with these conventional media, they provide multiple models for skill learning, and can increase the immediacy and authenticity of learning content, which is advantageous to many learners.

Computer simulations can be used to increase content knowledge. For example, a simulated marine ecosystem can be used to teach ecology concepts. Simulations are particularly well suited to confronting students with their misconceptions about essential learning concepts and helping them to develop more accurate conceptual models. Simulations can also be used to develop skills. For example, simulated science experiments can be used to facilitate mastery of science process skills. Computer simulations are available on the web, as well as in software form.

Using the Internet

The Internet is a global web of computers that are connected to each other. This connection enables computer users to share information and , resources. In simple terms, the Internet has two main parts - the World. Wide Web (WWW) and e-mail. No one owns the Internet, and anyone can use it. You can put your own information onto the Internet by making your own website, or you can visit the web sites that other people have created. You can also send and receive e-mail as long as you have an e-mail address. In this section, we look at the ways you can use the WWW and e-mail to support your teaching.

*The World Wide Web*

The World Wide Web (WWW) allows computer users to view multimedia materials (like those on CD-Roms) through a computer software programme called a 'browser' (such as Netscape Navigator, Internet Explorer or Mosaic). This means that you can visit web sites that have been created by other users, or you can create your own websites. Some websites have been specifically designed for educational content. These take users through carefully designed content, in much the same way as was discussed under *Using the computer as a tutor.* The biggest difficulty here (besides the expense of being online) is that there is very little relevant content for South African learners at this stage. Some tertiary education courses are now being offered online, but there is currently very little available for South African school learners.

Increasingly, though, learner sites are being developed. Here are some useful sites:

• The Learning Channel at *www.learn.co.za* has materials based on Science, English, Business Economics and Geography for Grade 12 and some additional materials for Grades 9, 10 and II.

• Cyberschool Africa *(www.cyberschool.co.za)* has developed online materials for matriculants in mathematics, science and biology.

• The Mathematics Learning and Teaching Initiative (MALATI) at [*www.wcape*](http://www.wcape)*. school.za/malati* is an excellent resource site for mathematics teachers.

• The University of the Western Cape has created an online South African Grade 10 Biology textbook at *http://www.botany.uwc.ac.za/scCed/index.htm.* It is textbased and content driven, and has links to other resources on each topic of the Grade 10 Biology syllabus.

*Navigating the Internet: using search engines*

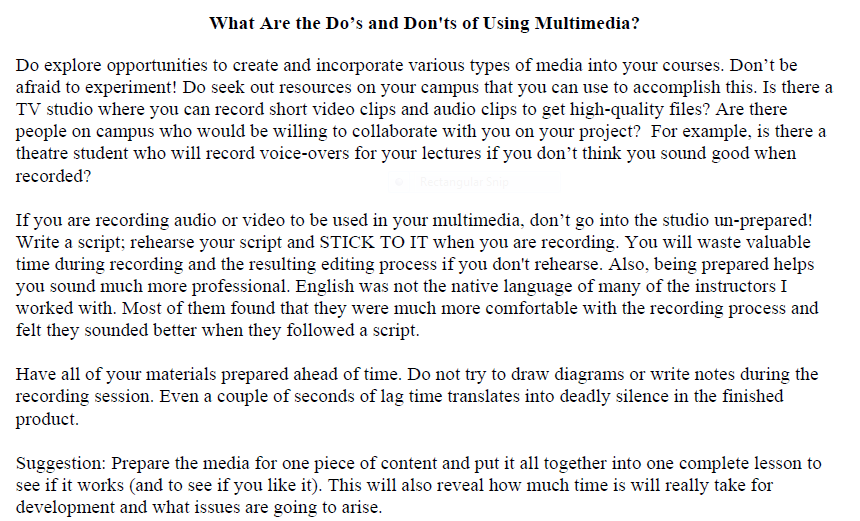
Search engines or directory websites enable you to enter key words and phrases, and scour the WWW for websites on any topic you wish to explore. They perform roughly the same function as a catalogue cabinet (or computer search programme) in a library.

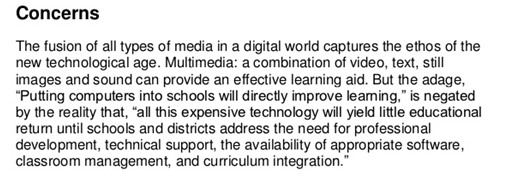
In a library, though, there is a librarian in charge and only a finite number of resources. So, if what you are looking for is not in the catalogue, you know it's not in the library. No one is in charge of the Internet, and anyone can contribute information. As a result, there is no central catalogue of websites, so finding what we are looking for would be much more difficult without search engines and directories. One of the main difficulties is that information comes from all over the world. It is therefore often helpful to limit your search to websites from a specific place (like South Africa). There are two main ways in which we can search the WWW:

• Search engines use computer programmes to wander through the WWW and follow links collecting details from these websites to catalogue and index.

• Directories look like search engines and perform the same functions, but finding and cataloguing the web sites is done by human researchers, not through programmes.

**MODULE FIVE: DO’S AND DON’T’S OF USING MULTIMEDIA**





**Additional guidelines for proper usage of multimedia**

* Use both digital and non-digital multimedia
* Allow learners to be part of the usage of the multimedia
* Always prepare for the lesson by reflecting on the appropriateness of the selected multimedia resource to be used.
* Bring in an element of surprise to the learning environment.
* Allow the use of the media to be directly linked to the learner’s world.
* Always keep and archive resources used.
* Constantly keep updated with current trends in digital multimedia usage.
* Incorporate social media into the learning process.
* Be clinical on how the media is used as it should not loose essence to the topic or lesson.